CLAIMS

1. A blower comprising: an impeller on which a plurality of axial flow blades are arranged while mounted at circumferential intervals to an outer peripheral surface of a boss; a case surrounding the impeller; and a bell mouth cylindrically constricted so as to guide a gas into the case, characterized in that an inner diameter of the bell mouth is smaller than an outer diameter of the impeller.

2. A blower according to Claim 1, characterized in that a dimension of the inner diameter of the bell mouth is 50% or more of a dimension of the outer diameter of the impeller.

3. A blower according to Claim 1, characterized in that an inner face of a constricting portion extending from an expansion diameter side end portion to a reduction diameter side end portion of the bell mouth is formed as a curved surface spaced apart from a rotation center axis of the impeller by a distance that is circumferentially uneven.

4. A blower comprising: an impeller on which a plurality of blades are arranged while mounted at circumferential intervals to an outer peripheral surface of a boss; a case surrounding the impeller; and a bell mouth cylindrically constricted so as to guide a gas into the case, characterized in that an inner diameter of the bell mouth is smaller than an outer diameter of the impeller, and that a portion of the blade portion situated on an outer peripheral side of the inner diameter of the bell mouth protrudes from a reduction diameter side end portion toward an expansion diameter side end portion of the bell mouth in a direction along a rotation center axis of the impeller.

5. A blower according to Claim 4, characterized in that, when the blades of the impeller are projected onto a plane perpendicular to the rotation center axis thereof, each of curves that are formed by connecting center points of arc lengths of circumferentially extending arcs formed through overlapping of concentric circles, which radially extend around an intersection point of the plane and the rotation center axis, and the projected blades, is defined as a circumferential center curve, when an angle made by a straight line connecting the intersection point and a boss-side end point of the circumferential center curve and by a straight line connecting the intersection point and an arbitrary point in the circumferential center curve is defined as a forward angle θ with a rotating direction of the blades taken as positive, and when a change ratio per unit radial length of the forward angle θ is defined as an advance ratio, each blade has, in a radial direction, a sweepforward wing portion which is on a boss side and which exhibits a positive value of the advance ratio, and a sweepback wing portion which is on an outer peripheral side of the blade and which exhibits a negative value of the advance ratio, with the arc length of each blade increasing from the boss side toward the outer peripheral side.

6. A blower according to Claim 5, characterized in that a portion of the sweepback wing portion protrudes from the reduction diameter side end portion toward the expansion diameter side end portion of the bell mouth in a direction along the rotation center axis of the impeller.

7. A blower comprising a boss and a plurality of blades mounted at circumferential intervals to an outer peripheral surface of the boss, characterized in that, when the blades of the impeller are projected onto a plane perpendicular to the rotation center axis thereof, each of curves that are formed by connecting center points

of arc lengths of circumferentially extending arcs formed through overlapping of concentric circles, which radially extend around an intersection point of the plane and the rotation center axis, and the projected blades, is defined as a circumferential center curve, when an angle made by a straight line connecting the intersection point and a boss-side end point of the circumferential center curve and by a straight line connecting the intersection point and an arbitrary point in the circumferential center curve is defined as a forward angle θ with a rotating direction of the blades taken as positive, and when a change ratio per unit radial length of the forward angle θ is defined as an advance ratio, each blade has, in a radial direction, a sweepforward wing portion which is on a boss side and which exhibits a positive value of the advance ratio, and a sweepback wing portion which is on an outer peripheral side of the blade and which exhibits a negative value of the advance ratio, with the arc length of each blade increasing from the boss side toward the outer peripheral side.

8. A blower according to Claim 7, characterized in that the blower comprises a case surrounding the blades, and a bell mouth cylindrically constricted so as to guide a gas into the case, and that an the inner diameter of the bell mouth is smaller than an outer diameter of the blades.

9. A blower according to Claim 8, characterized in that a boundary portion constituting a boundary between the sweepforward wing portion and the sweepback wing portion substantially coincides with the inner diameter of the bell mouth.

10. A blower according to Claim 8, characterized in that a boundary portion constituting a boundary between the sweepforward wing portion and the sweepback wing portion is situated on an outer

peripheral side of the inner diameter of the bell mouth.

11. A blower according to Claim 8, characterized in that a ratio of a diameter of the boundary portion to the inner diameter of the bell mouth ranges from 80% to 130%.

12. A blower according to Claim 11, characterized in that the ratio ranges from 100% to 110%.

13. A blower according to Claim 7, characterized in that an inner face of a constricting portion extending from an expansion diameter side end portion to a reduction diameter side end portion of the bell mouth is formed as a curved surface which is spaced apart from the rotation center axis of the impeller by a distance that is circumferentially uneven.

14. A blower according to Claim 7, characterized in that, when a straight line extended from a center point of a height in a direction of the rotation center axis at a portion of each blade in contact with the boss to an outer peripheral portion of the blade perpendicularly to the rotation center axis is defined as a straight line V, when a line obtained by connecting center points of the height in the direction of the rotation center axis at each radius of the blade is defined as a radial direction center line Z, and when a line connecting the center line and an arbitrary point in the radial direction center line Z is defined as a straight line Y, the straight line Y is inclined toward a gas suction side with respect to the straight line V.

15. A blower according to Claim 7, characterized in that, in the circumferential center curve of the sweepforward wing portion, an angle of inclination of a tangent to the circumferential center

curve increases gradually and to a large degree toward a gas discharge side as the circumferential center curve extends from the boss side toward a boundary portion side, and that the angle of inclination of the tangent to the circumferential center curve increases gradually and to a large degree toward a gas suction side as the circumferential center curve extends from the boundary portion side toward the outer peripheral side.

16. A blower according to Claim 7, characterized in that the sweepback wing portion of each of the blades has an advance ratio ranging from -2.0 (°/mm) to -2.9 (°/mm).